

# NOTICES OF PUBLIC INFORMATION

Notices of Public Information contain corrections that agencies wish to make to their notices of rulemaking; miscellaneous rulemaking information that does not fit into any other category of notice; and other types of information required by statute to be published in the *Register*. Because of the variety of material that is contained in a Notice of Public Information, the Office of the Secretary of State has not established a specific format for these notices.

## NOTICE OF PUBLIC INFORMATION

### DEPARTMENT OF ENVIRONMENTAL QUALITY

#### **1. Purpose of Notice of Public Information:**

This Notice is for the proposed Verde River Turbidity TMDL and the Peck's Lake TMDL. Pursuant to A.R.S. § 49-234, the Department is required to develop total maximum daily loads for navigable waters that are listed as impaired. A.R.S. § 49-234(D) states:

"For each impaired water, the department shall prepare a draft estimate of the total amount of each pollutant that causes the impairment from all sources and that may be added to the navigable water while still allowing the navigable water to achieve and maintain applicable surface water quality standards. The department shall provide public notice and allow for comment on each draft estimate and shall prepare written responses to comments received on the draft estimates. The department shall publish the determinations of total pollutant loadings that will not result in impairment that it intends to submit initially to the regional administrator, along with a summary of the responses to comments on the estimated loadings, in the Arizona administrative register at least forty-five days before submission of the loadings to the regional administrator. Publication of the loadings in the administrative register is an appealable agency action pursuant to title 41, chapter 6, article 10 that may be appealed by any party that submitted written comments on the estimated loadings. If the department receives a notice of appeal of a loading pursuant to section 41-1092, subsection B within forty-five days of the publication of the loading in the Arizona administrative register, the department shall not submit the challenged loading to the regional administrator until either the challenge to the loading is withdrawn or the director has made a final administrative decision pursuant to section 41-1092.08."

The Department published public notice of draft total pollutant loadings in a newspaper of general circulation in the areas affected by this Notice, but did not receive any written comments.

#### **2. Background:**

##### **Total Maximum Daily Load (TMDL) Process**

A Total Maximum Daily Load (TMDL) represents the total load of a pollutant that can be discharged to a water body on a daily basis and still meet the applicable water quality standard [assumed to be the existing standard(s)]. The TMDL can be expressed as the total mass or quantity that can enter the water body within a unit of time. In most cases, the TMDL determines the allowable pounds per day of a constituent and divides it among the various contributors in the watershed as waste load (i.e., point source discharge) and load (i.e., nonpoint source) allocations. The TMDL must also account for natural background sources and provide a margin of safety. For nonpoint sources such as accelerated erosion or internal nutrient cycling, it may not be feasible or useful to derive a pounds per day figure. In such cases, a percent reduction in pollutant loading may be proposed.

A load analysis may take the form of a phased TMDL, if source reduction or remediation can be better accomplished through an iterative approach. The key will be to identify the management strategy necessary to minimize the water quality concerns in Peck's Lake, while acknowledging ecosystem limitations and maximizing support of the lake's designated uses. The Peck's TMDL will be phased to effectively build monitoring and management plans for the lake and watershed that address seasonal constraints to the ecosystem.

In Arizona, as in other states, changes in standards or the establishment of site-specific standards are the result of ongoing science-based investigations or changes in toxicity criteria from EPA. Changes in designated uses and standards are part of the surface water standards triennial review process and are subject to public review. Standards are not changed simply to bring the water body into compliance, but are based on existing uses and natural conditions.

Both of these TMDLs have met or exceeded the following EPA Region IX criteria for approval:

**Plan to meet State Water Quality Standards:** TMDL includes a study and a plan for the specific pollutants that must be addressed to ensure that applicable water quality standards are attained.

**Describe quantified water quality goals, targets, or endpoints:** The TMDL must establish numeric endpoints for the water quality standards, including beneficial uses to be protected, as a result of implementing the TMDL. This often requires an interpretation that clearly describes the linkage(s) between factors impacting water quality standards.

- **Analyze/account for all sources of pollutants.** All significant pollutant sources are described, including the magnitude and location of sources.
- **Identify pollution reduction goals.** The TMDL plan includes pollutant reduction targets for all point and nonpoint sources of pollution.
- **Describe the linkage between water quality endpoints and pollutants of concern.** The TMDL must explain the relationship between the numeric targets and the pollutants of concern. That is, do the recommended pollutant load allocations exceed the loading capacity of the receiving water?
- **Develop margin of safety that considers uncertainties, seasonal variations, and critical conditions.** The TMDL must describe how any uncertainties regarding the ability of the plan to meet water quality standards that have been addressed. The plan must consider these issues in its recommended pollution reduction targets.
- **Provide implementation recommendations for pollutant reduction actions and a monitoring plan.** The TMDL should provide a specific process and schedule for achieving pollutant reduction targets. A monitoring plan should also be included, especially where management actions will be phased in over time and to assess the validity of the pollutant reduction goals.
- **Include an appropriate level of public involvement in the TMDL process.** This is usually met by publishing public notice of the TMDL in a newspaper of general circulation in the area affected by the study, circulating the TMDL for public comment, and holding public meetings in local communities. Public involvement must be documented in the state's TMDL submittal to EPA Region 9.
- **In addition, these TMDLs comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 3.1.** Publication of these TMDLs in the *Arizona Administrative Register* is required per Arizona Revised Statute, Title 49, Chapter 2, Article 3.1 prior to submission of the TMDL to EPA. A.R.S. § 49-234(D) requires the Department publish a 45-day notice in the *Arizona Administrative Register* of the determination of total pollutant loadings that will not result in impairment and a summary of comments received to the initial TMDL public notice in the local newspaper. Following the first notice of the loadings, the Department shall publish a second 45-day notice in the *Register* on the proposed determination of allocations and include a summary of the response to comments received on the notice of the loadings.

### **Peck's Lake TMDL**

#### **Background**

Peck's Lake, an oxbow of the Verde River near Clarkdale, Arizona, was placed on the Water Quality Limited List (303d List) in 1998 for violations of the state's dissolved oxygen and pH standards. Verification monitoring was conducted in 1999 and a TMDL analysis was undertaken in the spring of 2000.

There were 7 of 10 violations of the dissolved oxygen standard (within the top meter) and 7 of 16 violations of the pH standard (greater than 9.0 SU); this information is contained in the 1998 305(b) Assessment Report, page 117. For the 305(b) Assessment Report, a standards exceedences in excess of 10% or 25% of the number of samples taken, may qualify for 303(d) listing depending on the parameter(s) of concern, the frequency of monitoring, and whether corroborating data exists. In the case of Peck's Lake, low DO, high pH, and an abundance of aquatic macrophytes and algae is a classic aging pattern of highly productive shallow lakes.

Subsequent data collected by ADEQ Lake Program staff in 1999 corroborate the 1997 summer data for dissolved oxygen but not for pH. Data from 1999 did not capture pH values in excess of the standard, though it is likely the peak growing period was June and July. Die-off and decay appeared to be well under way by August. Although 1999 pH violations were down to 10% from 43%, pH will be considered in the TMDL analysis, as will the role and implications of the narrative nutrient standard for Peck's Lake. Table 2-2 shows the results from 1999 sampling.

#### **TMDL Analysis**

The TMDL analysis focused on nutrient loading to Peck's Lake, considering both ambient conditions and projected development. The analysis combined a watershed loading model (Generalized Watershed Loading Function) with a lake receiving water model (BATHTUB) for linkage of nutrient loading to algal and macrophyte productivity. This approach was justified based upon the large biomass of aquatic macrophytes in the lake. Algal and plant productivity were consequently tied to biological oxygen demand, availability of dissolved oxygen and pH.

The results of the TMDL analysis indicated that under current conditions, the largest nutrient load to Peck's Lake is from internal cycling. Rooted and submerged aquatic vegetation is the dominant type of plant growth in Peck's Lake, since the lake has a relatively shallow average depth (4 feet). The TMDL sets the goal of harvesting (cutting and removing) 25% of the weed biomass annually from Peck's Lake. The 25% threshold is justified by the fact that exceedences of the dissolved oxygen standard have been with 25% of meeting the warm-water standard of 6.0 mg/L. This action is expected to achieve whole lake water quality standards for dissolved oxygen. This recommendation is based on model evaluation of the relatively large contribution of weed decay to lake biological demand (BOD). [High BOD is associated with low dissolved oxygen] Disruption of the internal nutrient cycle (load) through active harvesting will accomplish two objectives: 1) nutrients in the form of aquatic vegetation will be removed from the cycle, and 2) reduction in biomass will lower BOD and result in more oxygen available for fish and other aquatic organisms.

Modeling analysis demonstrated that the second largest nutrient load to Peck's Lake comes from native vegetation in the immediate watershed. Based upon evaluation of upstream USGS gage data, the nutrient load from the Verde River has not changed significantly within the past several decades and will be considered natural background in this TMDL. Current lake water quality conditions may also have been influenced by the presence of a 9-hole golf course adjacent to the lake from the 1920s to 1992 and a dairy just below the lake outlet. Phelps Dodge Corp. (PD) owns the land around Peck's Lake and has plans to develop approximately 550 acres. The proposed Verde Valley Ranch development will include a new 18-hole golf course, residential housing, and some commercial infrastructure. Future nutrient load projections were calculated based upon the Storm Water Pollution Prevention Plan (SWPPP) provided by PD and their contractor, URS Griner-Woodward Clyde. Modeling results demonstrated the need for implementing and maintaining all proposed best management practices to contain the 2-yr, 24 hr event.

Evaluation of data from Peck's Lake shows that pH has improved since flow-through was augmented in 1997. Only marginal improvements are necessary to achieve pH standards. Though not modeled directly, the reduction of aquatic biomass, reduction in BOD, and increase in whole lake dissolved oxygen is expected to alleviate pH excursions. If, after two years of harvesting, pH is still exceeding the upper standard of 9.0 SU in hot summer months, and it can be demonstrated that potential ammonia toxicity exists (pH and temperature dependent), additional aeration may be required.

#### ***Load Allocation***

Taking into consideration the Margin of Safety based upon conservative assumptions, TMDL allocations will reflect no net gain in external nutrient loading to Peck's Lake. Internal nutrient loading of both total phosphorus and total nitrogen will be reduced 25% through harvesting of aquatic macrophytes and other methods. Flow through the lake will be maintained under the existing passive system. If passive flow does not prove sufficient over the first 5-yr phase of this TMDL, addition of aeration devices may be necessary. A detailed lake monitoring plan has been added to the SWPPP and will be supplemented with monitoring by ADEQ and the AZ Game and Fish Dept. The nutrient reduction is reflected in the TMDL equation below; the TMDL load expected to meet DO and pH standards is as follows:

#### **Total Nitrogen:**

LA1 (natural background) + WLA1 (development) + LA2 (in-lake) + MOS = TMDL for N

LA1 (8.32 lbs/day + 2.32 lbs/day) + WLA1 (4.56 lbs/day) + LA2 (59.20 lbs/day<sup>1,2</sup>) + MOS = **74.40 lbs/day**

#### **Total Phosphorus:**

LA1 (natural background) + WLA1 (development) + LA2 (in-lake) + MOS = TMDL for P

LA1 (0.84 lbs/day + 0.07 lbs/day) + WLA1 (0.53 lbs/day) + LA2 (9.78 lbs/day<sup>1,2</sup>) + MOS = **11.15 lbs/day**

<sup>1</sup> lake inflow + atmospheric deposition

<sup>2</sup> in-lake load represents a 25% reduction from current conditions

#### ***Margin of Safety***

The Margin of Safety for this TMDL consists of several conservative assumptions incorporated into the models:

- Extreme hydrologic events were included in the watershed loading analyses and indicate the range of watershed nutrient loadings expected
- Long-term average loading results were used, since lakes respond to nutrient loading slowly
- BATHTUB predictions do not include the effects of macrophyte shading effects on phytoplankton, therefore eutrophication predictions are conservative
- If macrophyte growth in the lake was reduced, calculations for nutrients would be conservative, since the actual inter-

nal nutrient fluxes from macrophyte decomposition would be reduced

- The macrophyte densities and turnover rates used in the nutrient budget and dissolved oxygen calculations assumed the higher values from the literature rather than some of the lower estimates provided from the BATHTUB calibrations; and
- The GWLF loading predictions did not include reductions that would be achieved by the sand filter BMPs because there is no way to directly include them in the model. However, these reductions are included in the SWPPP.

### ***TMDL Implementation***

TMDL implementation will include various strategies to minimize input from runoff and reduce internal nutrient cycling in Peck's Lake. Measures include macrophyte harvesting, flushing, and interception and treatment of storm runoff from residential and commercial areas. Runoff from the golf course will be totally contained on-site, with the exception of the lower part around the oxbow, which will have lysimeters installed to monitor shallow groundwater. A comprehensive and detailed monitoring plan has been incorporated in the Storm Water Pollution Prevention Plan for the Verde Valley Ranch development. In addition to monitoring under this permit, ADEQ and AGFD will also participate in ongoing lake monitoring.

### ***Public Participation Component***

The public participation requirement of this TMDL has been met through notice and participation by stakeholders in several Focus Group sessions. Focus Group sessions were attended by local community members and other stakeholders, including Clarkdale, Cottonwood and Jerome, Yavapai County, the Phelps Dodge Corporation, a local chapter of the National Audubon Society, Arizona State Parks, and the Verde Watershed Association. Meetings were held in Clarkdale every three weeks over a six-month period. ADEQ staff were present at all meetings; the ADEQ contractor, Tetra Tech, Inc., was present at two meetings to explain the modeling approach and respond to questions. The Draft TMDL was released in June 2000. The Draft Final TMDL was first released in December 2000.

The revised Draft Final TMDL was public noticed for 30 days beginning on September 15, 2001, in the *Verde Independent*. The Department received no comments pursuant to that public notice. This publication in the *Arizona Administrative Record* is the first of two 45-day notices required per Arizona Revised Statute, Title 49, Chapter 2, Article 3.1. A.R.S. § 49-234(D) requires the Department publish, in the *Arizona Administrative Register*, the determination of total pollutant loadings that will not result in impairment and a summary of comments received to the initial public notice. Following the notice of the loadings, the Department shall publish a second 45-day notice in the *Register* on the proposed determination of allocations and include a summary of the response to comments received on the notice of the loadings.

## **Verde River Turbidity TMDL**

### **Executive Summary**

Section 303(d) of the Clean Water Act requires that States develop Total Maximum Daily Loads (TMDLs) for surface waters that do not meet, and maintain, applicable water quality standards. A TMDL sets the amount of a given pollutant that the water body can withstand without creating an impairment of that surface water's designated use. The TMDL by definition (40 CFR Part 130) is the sum of all Waste Load Allocations (point source) and Load Allocations (non-point source) with the inclusion of a margin of safety and natural background conditions.

The Verde River originates in Big Chino Valley north of Prescott, Arizona at the confluence of Chino Wash and Granite Creek, and terminates at the confluence to the Salt River, near Mesa, Arizona. The three stream segments of the Verde River that are listed as impaired due to turbidity occur in the upper section (from Perkinsville to below Camp Verde). The turbidity standard for aquatic and wildlife warm water streams is currently set at 50 Nephelometric Turbidity Units (NTU). Excessive turbidity was suspected as a possible stressor to the health of the aquatic ecosystem and detracts from recreational uses.

The Verde River was listed as an impaired water due to samples collected from 1988-1995 (see table 1). The Verde River has three reaches on the 303(d) list: from the Perkinsville bridge to the confluence with West Clear Creek, and two sections which are below Camp Verde; for a total of 37 miles.

The Target Load Capacity for the Verde River during the critical storm flows was calculated to be 731,793 lbs./day as Total Suspended Solids (TSS). The Measured Load was estimated to be 964,694 lbs./day as TSS. The TMDL for Turbidity (as TSS) for critical storm flow conditions is 731,793 lbs./day. The Load Reduction necessary is 232,901 lbs./day. During the average base flow conditions no Load Reduction is necessary, as there is no exceedence, there is an estimated – 31,255 lbs./day (TSS) gap between the Measured Load (20,672 lbs./day) and the Target Load (51,927 lbs./day). This information is presented as part of the Verde River TMDL Overview Chart which follows.

The turbidity impairment appears to be directly correlated to large storm events. Implementation projects and best management practices are aimed at improving the water quality by improving vegetative ground cover -thereby reducing

**Notices of Public Information**

excessive storm runoff and soil erosion through: road maintenance or closures, improved grazing strategies and practices, and watershed improvements on both uplands and riparian areas. Implementation of Best Management Practices (BMPs) will increase riparian vegetation, stabilize the stream banks, promote the development of flood plains, and minimize the impact of cattle in the general area – thus decreasing the contributions of sediment to the Verde River during higher flow storm events.

<b>Verde River TMDL Overview Chart</b>	
<b>Verde River Watershed Information</b>	
<i>Waterbody Name</i>	Verde River
<i>Drainage Area</i>	6,624 square miles
<i>Reservoirs</i>	Horseshoe Reservoir (1980 acres), Bartlett Lake (2375 acres)
<i>Special Status</i>	Wild and Scenic River status on 39.5 miles above Red Creek confluence (near Tangle Creek). Scenic status from Beasley Flat
<i>Unique Waters</i>	Oak Creek and the West Fork of Oak Creek
<i>Designated Uses</i>	Aquatic and Wildlife warm-water, Fish Consumption, Full Body Contact, Agriculture Irrigation and Agriculture Livestock Watering
<i>Communities</i>	Clarkdale, Cottonwood, Jerome, Sedona, and Camp Verde
<i>Counties</i>	Coconino, Maricopa, Yavapai
<i>Parks and Forests</i>	Tuzigoot, Montezuma's Castle and Well National Monuments, Deadhorse, Jerome, Red Rock, and Slide Rock State Parks, Tonto, Prescott, Kaibab, and Coconino National Forests
<i>Land Ownership</i>	64% USFS, 23% Private 10% State, 2% Tribal, and 1% other State and Federal owned
<i>Geology</i>	Sandstone and limestone primarily border the river from Perkinsville to Clarkdale

<b>303(d) Listed Verde River Stream Reaches of Concern Information</b>			
<i>Listed Segments Description</i>	Waterbody Name Waterbody ID (HUC #)	Reach Length of Listed Reach	Stressors
	Verde River 15060202-025	Sycamore - Oak Creek 25 miles	turbidity
	Verde River 15060202-037	Below Railroad Draw 6 miles	turbidity
	Verde River 15060203-027	Above - West Clear Creek 6 miles	turbidity
<i>T&amp;E Species Present</i>	spikedace ( <i>Meda fulgida</i> ), Colorado pikeminnow ( <i>Ptychocheilus lucius</i> ), razorback sucker ( <i>Xyrauchen texanus</i> )		
<i>Applicable Water Quality Standards</i>	Aquatic and Wildlife warm-water (A&Ww): turbidity standard = 50 NTUs		
<i>Potential Sources</i>	Pinyon and Juniper causing loss of grasses and shrubs; cattle grazing; OHVs; road cuts; silted in water catchments; and resuspension of sediment moving through the system.		
<i>Flow Variability</i>	Flows range from low flow conditions (around 20 cfs) to flood events greater than 100,000 cfs (near 150,000 cfs), as per a 65 year period of record from various USGS Gauge Stations.		
<i>Public Participation</i>	Through the Verde Watershed Association, the internet, and public noticing procedures as required by Arizona Revised Statutes 49-231 et al; which includes a 30-day notice in the local newspaper (Sept. 15, 2001) and two 45-day notices in the <i>Arizona Administrative Register</i> both which are to include response to comments on the previous notice.		

**Notices of Public Information**

<i>Watershed Group</i>	The Verde Watershed Association was formed in 1993 and meets monthly in the watershed. Consists of ADEQ, ADWR, USFS, local groups, private citizens, and local municipalities
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Verde River TMDL Calculations and Values			
Critical Storm Flow		Average Flows	
<i>Discharge Designed for</i>	1180 cfs (763 mgd)	<i>Discharge Designed for</i>	84 cfs (54 mgd)
<i>Background, lbs./day TSS</i>	8,736	<i>Background, lbs./day TSS</i>	8,736
<i>Waste Load Allocation, lbs./day TSS</i>	0	<i>Waste Load Allocation, lbs./day TSS</i>	0
<i>Load Allocation, lbs./day TSS</i>	+657,325	<i>Load Allocation, lbs./day TSS</i>	+39,265
<i>Margin of Safety, lbs./day TSS (10%)</i>	+65,732	<i>Margin of Safety, lbs./day TSS (10%)</i>	+3,926
<i>TMDL, lbs./day TSS</i>	731,793	<i>TMDL, lbs./day TSS</i>	51,927
<i>Measured Load, lbs./day TSS</i>	964,694	<i>Measured Load, lbs./day TSS</i>	20,672
<i>Load Reduction, lbs./day TSS</i>	232,901	<i>Load Reduction, lbs./day TSS</i>	NONE REQUIRED (-31,255)

Table 1 was taken from Arizona's Clean Water Act (CWA) Section 305(b) report, entitled "Arizona Water Quality Assessment, 1998, Volume II --Assessment Data and Standards." Table 1 shows the data used to list the Verde River as impaired due to turbidity.

TABLE 1									
Surface Water Monitoring Data For the Verde Watershed									
<i>Reach ID Number</i>	<i>Designated Uses</i>	<i>Agency Program Site ID, Site Description</i>	<i>Samples: Year-number</i>	<i>STANDARDS, OR CRITERIA EXCEEDED (Constituents are shown when results indicate a standard or criterion has been exceeded)</i>					
				Constituent	Unit	Standard or Criterion	Range of Values	Frequency Exceeded	Use Support
Verde River 150602 0 2-025	A&Ww,F C, FBC, AGI, AGL	ADEQ Special Investigation FSN-VRDH1 At Deadhorse Ranch Road	1991-11 limited	Turbidity	NTU	50	3.6-396	2/16	Partial A&Ww
		ADEQ Fixed Station Network FSN-VRCW1 Below Cottonwood	1992-6	Turbidity	NTU	50	9.1-60	1/4	Partial A&Ww
		ADEQ Fixed Station Network FSN-VRC3 Below USGS gauge near Clarkdale	1991-4	Turbidity	NTU	50	2.6-1190	1/6	Partial A&Ww

**Notices of Public Information**

		USGS Fixed station Net- work 09504000 Near Clarkdale	1991-12 1992-12 1993-12 1994-6 1995-6 1996-6 1997-6	Turbidity	NTU	50	0.6- 460	3/36	Full
Verde River 150602 0 2-037		ADEQ Fixed Station Network FSN-VRP1 Below Perkins- ville Bridge	1991-6 1992-6 1993-6 1996-5	Turbidity	NTU	50	2.0- 1900	5/23	Partial A&Ww
Verde River 150602 0 3-025		ADEQ Biocriteria Development VER7-00IM At Beasley Flat	1995-2	Turbidity	NTU	50	7.4-61	1/2	Partial A&Ww
		ADEQ Fixed Station Network FSN-VRC2 At Beasley Flat, near Camp Verde	1988-12 1989-12 1990-7 1991-8	Turbidity	NTU	50	6.3-93	3/39	Full

Table 1 (305B Assessment Report data summary) used a total of 126 turbidity results to assess and list the Verde River as impaired due to excessive turbidity. Of the 126, 16 were reported as exceeding the 50 NTU turbidity standard. This equates to an overall 13% exceedence ratio. Currently, it is not known how many of these were laboratory versus actual field turbidity results. In order to be listed in full support, less than ten percent of the data set must be below the standard. Ten percent to 25% exceedences are assessed as being in partial support. A total of 214 field turbidity results have been found, of these 24 were documented to have exceeded the turbidity standard. This equates to an 11% exceedence ratio, or 1% away from full support.

**3. The name and address of agency personnel with whom persons may communicate regarding the public information:**

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